

CLAIM

[1] A honeycomb structure comprising:

a honeycomb structural part, which has partition walls for forming a plurality of cells partitioned in a honeycomb shape and for forming recesses on an outer peripheral surface, and

an outer wall part disposed on the outer peripheral surface of the honeycomb structural part,

wherein voids are formed in the recesses between the outer wall part and the honeycomb structural part.

[2] A honeycomb structure according to claim 1, wherein, in the recesses, the average contact ratio of the outer wall part and the honeycomb structural part is 0.9 or less.

[3] A honeycomb structure according to claim 1 or 2, wherein the honeycomb structural part mainly comprises a ceramic material or a metal material, and the outer wall part mainly comprises a ceramic material.

[4] A honeycomb structure according to any one of claims 1 to 3, wherein an interface exists in the boundary between the outer wall part and the honeycomb structural part.

[5] A honeycomb structure according to any one of claims 1 to 4, wherein the honeycomb structural part contains a material having an absorption function and/or a catalyst function.

[6] A honeycomb structure according to any one of claims 1 to 5, wherein at least a part of the cells are plugged at edges and used as a filter.

[7] A honeycomb structure according to any one of claims 1

to 6, wherein catalysts are carried in the cells and/or in the partition walls.

[8] A honeycomb structure according to claim 7, wherein the catalysts have a function for purifying auto exhaust fumes.

[9] A method of manufacturing a honeycomb structure comprising:

- a step of obtaining a formed body by forming which has partition walls for forming a plurality of cells partitioned in a honeycomb shape;

- a step of drying the formed body;

- a step of obtaining a fired body by firing the formed body;

and

- a step of forming an outer wall part by disposing a coating material on the outer peripheral surface of the formed body or the fired body,

wherein the coating material is disposed so as to form voids in at least a part between the outer peripheral surface and the outer wall part at the step of forming the outer wall part.

[10] A method of manufacturing a honeycomb structure according to claim 9, comprises a step of processing and eliminating at least a part of the outer periphery of the formed body or the fired body prior to the step of forming the outer wall part.

[11] A method of manufacturing a honeycomb structure according to claim 10, wherein the step of processing and eliminating the outer peripheral part is executed prior to the step of firing the formed body.

[12] A method of manufacturing a honeycomb structure according to claim 10, wherein the step of processing and eliminating the outer peripheral part is executed after the step of firing the formed body.

[13] A method of manufacturing a honeycomb structure according to any one of claims 10 to 12, wherein a formed body including an outer peripheral wall integrated with the partition walls is obtained at the step of obtaining the formed body, and the outer peripheral part including the outer peripheral wall is processed and eliminated at the step of processing and eliminating the outer peripheral part.

[14] A method of manufacturing a honeycomb structure according to claim 9, wherein a formed body not including the outer peripheral wall is obtained at the step of obtaining the formed body, and the outer wall part is formed by disposing the coating material on the outer peripheral surface of the formed body or the fired body without processing and eliminating the outer peripheral part of the formed body or the fired body.

[15] A method of manufacturing a honeycomb structure according to any one of claims 9 to 14, wherein an organic material is disposed on the outer peripheral surface of the formed body or the fired body at the step of forming the outer wall part, and voids are formed in at least a part between the outer peripheral surface and the outer wall part by removing the organic material after disposing the coating material on the organic material.

[16] A method of manufacturing a honeycomb structure according to any one of claims 9 to 14, wherein there is used a coating

material whose viscosity is adjusted so as to form voids in at least a part between the outer peripheral surface and the outer wall part of the formed body or the fired body at the step of forming the outer wall part.

[17] A method of manufacturing a honeycomb structure according to any one of claims 9 to 16, comprises a step of plugging the edges of at least a part of cells prior to the step of firing the formed body.

[18] A method of manufacturing a honeycomb structure according to any one of claims 9 to 16, wherein a step of plugging the edges of at least a part of cells after the step of firing the formed body is included, and second firing is executed after the plugging step.